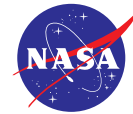




**USAID**  
FROM THE AMERICAN PEOPLE

**SERVIR**  **GLOBAL**



## MEETING THE DEVELOPMENT CHALLENGE SERVIR IN THE HINDU KUSH-HIMALAYAN REGION

**SERVIR** in the Hindu Kush-Himalayan region is a joint development initiative of NASA and USAID, working in partnership with the International Centre for Integrated Mountain Development (ICIMOD), based in Kathmandu, Nepal. ICIMOD collaborates with member states in the Hindu Kush-Himalayan region to promote sustainable development.

Connecting information from space to village, NASA, USAID, and SERVIR-Himalaya use Earth observation and geospatial technology to support development decision-making. SERVIR-Himalaya responds to the needs of developing nations as they adapt to changes in the region, build resilience to climate change, and strive to secure food, water, forests, and energy for their citizens.

### THE HINDU KUSH-HIMALAYAN REGION

One of the most fragile mountain systems in the world, the Hindu Kush-Himalayas are reservoirs of biodiversity and, as the “water towers” of Asia, provide water to more than one billion people downstream. The impacts of climate change are evident in the region’s snow-cover loss, shrinking glaciers, vegetation changes, biodiversity loss, erratic weather patterns, and increasing natural disasters. The combination of rapid economic growth, population dynamics, and unsustainable use of natural resources has stressed the mountain ecosystem, with far-reaching implications for socioeconomic development. Ensuring the security of the Hindu Kush-Himalayan future requires improved water, air, and land resource management. ICIMOD works in concert with its member states to achieve these goals.



ALEX TREADWELL/ICIMOD

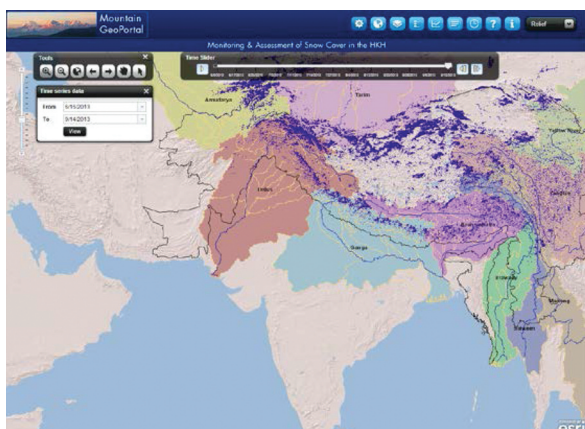
### BUILDING TECHNICAL CAPACITY TO USE EARTH OBSERVATION

ICIMOD promotes sustainable development through SERVIR-Himalaya by using Earth observation information from satellites to support problem-solving applications for forest management, and to reduce the impacts of climate change on water, ecosystems, and agriculture. SERVIR combines NASA satellite observations and predictive models, along with other geographic information from satellites and field-based sensors for improved scientific knowledge and development decision-making in the Hindu Kush-Himalayan region. SERVIR-Himalaya builds local capacity by enhancing the expertise of Hindu Kush-Himalayan scientists, analysts, and decision-makers to produce, analyze, and use this Earth observation and geospatial technology.

### SERVIR-HIMALAYA IN ACTION

#### *Detecting and Monitoring Forest Fires*

Forest fires have become an environmental concern in recent years in the Hindu Kush-Himalayan region, posing a threat to human life, property, and to the



Snow-cover map for the Hindu Kush-Himalayan region.

area's natural environment. During a recent dry season in Nepal, wildfires destroyed vast hectares of forest. Through SERVIR-Himalaya, data from NASA satellites are helping Nepalese officials detect and monitor forest fires, research fire patterns, and assess damage in burnt areas. A new fire-alert system developed by SERVIR-Himalaya sends out email or text messages within 20 minutes of detecting a fire, so area fire officials can mobilize fire-suppression efforts and warn villagers of impending danger. A similar system will soon be introduced in Bhutan and Bangladesh.

### Monitoring Land Cover and Use

Bhutan is experiencing developmental pressures, urban expansion, and increased demand for agricultural land. At Bhutan's request, SERVIR-Himalaya is strengthening the nation's ability to assess changes in land cover and land use to help conserve biodiversity, manage natural resources, and protect the environment. SERVIR-Himalaya offers Bhutan an integrated database and maps showing land-cover changes over the past 30 years. These tools help guide development decision-making and policies in Bhutan, supporting more effective forest management and land-use practices. Nepal is also using data from SERVIR-Himalaya to analyze how changes to land cover and deforestation levels impact that nation's greenhouse gas emissions. This knowledge will help Bhutan and Nepal more effectively balance the human needs for development and agriculture with responsible forestry and biodiversity management.

### Assessing Water Resources

The low-lying deltas downstream of the Hindu Kush-Himalayas, with their dense population and water-intensive agriculture, are vulnerable to both drought and flooding. In these river systems, snowmelt is a significant source of water and so changes in snow pack and temperature have a major impact on downstream water availability. Strategies for adapting to climate change and meeting growing demand for water require accurate assessments of snow-cover and the amount of water stored in the snow. SERVIR-Himalaya's historical and near real-time snow-cover mapping and analysis enable water resource managers to quantify the volume of water available in the snow pack and more effectively manage the region's water resources. In addition, the region has a growing number of potentially hazardous glacier lakes. A SERVIR project is exploring the dynamics associated with these lakes, including the threats of ice avalanches, glacier lake outburst floods, and landslides. The objective is to identify areas at risk and define the threats to agriculture, infrastructure, and villages.



NABIN BARAL/ICIMOD

ICIMOD works with water resource managers at the river basin level to bring scientific analysis to flood-related topics: risk management, vulnerability mapping, preparedness, conservation, and the development of water, land, and related resources. For example, another SERVIR project uses satellite data to help Bangladeshi water resource managers produce 8-day flood forecasts, a great improvement over the 3-day forecasts possible before.

**SERVIR** strengthens the ability of governments and other development stakeholders to incorporate Earth observations and geospatial technologies to respond to natural disasters, improve food security, safeguard human health, manage water and natural resources. Improved management of natural resources also helps to identify opportunities to improve economic growth while lowering greenhouse gas emissions and building resilience to climate change.

FIND OUT MORE AT  
**[www.servirglobal.net](http://www.servirglobal.net)**